To: Alexander, Shanna[Alexander.Shanna@epa.gov]; Adams, Glenn[Adams.Glenn@epa.gov]; Richards, Jon M.[Richards.Jon@epa.gov]
From: Amoroso, Cathy[/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C5033745779E4121B626D62341A9B89C-AMOROSO, CATHY]
Sent: Tue 12/21/2021 8:33:34 PM (UTC)
Subject: FW: Oak Ridge Reservation rad fish tissue data 2005-2020
Aquatic Biota 2005-2020 RADS.xlsx
Fish_Tissue.html

From: Courtney Thomason <Courtney.Thomason@tn.gov>
Sent: Tuesday, December 21, 2021 2:46 PM
To: Amoroso, Cathy <Amoroso.Cathy@epa.gov>
Cc: Randy Young <Randy.Young@tn.gov>
Subject: Oak Ridge Reservation rad fish tissue data 2005-2020

Hi Cathy,

Randy relayed to me that you are looking for rad fish tissue data from around the Oak Ridge Reservation, not just from Bear Creek.

Shortly before DRAT started, I pulled 15 years of data from the OREIS database (2005-2020) to ask the same general questions you guys are asking in your latest EIT meeting. I have attached the raw data file as well as an RMarkdown html data summary report that I generated to help me make sense of the data. The raw data file is rads only, but the RMarkdown html report contains data for contaminants other than rads, including metals, PCBs, etc. You can just scroll down to the "Rads" section of the html file. In the RMarkdown html report, the tables are dynamic and can be filtered by year, site, COC, etc, and you can adjust the number of lines to display in the table at a time.

In general, rad sampling of fish tissue is very limited in terms of sample sizes, locations sampled, and radionuclides analyzed. Historically, unless there is data that is not available in OREIS that would suggest otherwise, DOE has heavily focused its rad sampling of fish in the Clinch River and has primarily only sampled for alpha, beta, Be-7, Cs-137 (primarily in the Clinch River), K-40, Sr-90, and tritium.

Since 2019, additional rad analytes have included americium, Co-60, curium, neptunium, plutonium isotopes, Tc-99, thorium isotopes, and uranium isotopes. This additional sampling is also almost entirely concentrated in the Clinch River, as well, though there is some sampling in Poplar Creek (ETTP) near to the confluence with the Clinch River.

There are some higher hits of some of the rads, including Cs-137 maxes of 0.944 pCi/g and 0.71 pCi/g in the Clinch River and a max of 0.686 pCi/g in Melton Branch near ORNL. These max hits occurred in 2013, 2006, and 2008, respectively.

There are also some other higher Cs-137 hits, for example, if you look in the raw data file, but these are often marked as non-detects with fairly high detection limits. An example of this is the 2008 0.686 pCi/g hit in Melton Branch. This data point is marked as non-detect with a detection limit of 1.3.

There are likely other examples of higher rad tissue concentrations. The html report I generated calculates averages, reports min/max, and lists the earliest sampling date and latest sampling date in the 2005-2020 window I examined. I will caution that the earliest and latest year columns in the html report do not correspond to specific data points. They just provide a sense of how recently or how long DOE has been sampling a rad contaminant at a particular location.

As for TDEC data, I will need some time to sift through older files and see what, if anything, I can find. If I find some useful TDEC fish tissue sampling data, I will share that, as well.

If you have questions, feel free to give me a call. I'll be available until 4:00pm today or all day tomorrow.

TN Department of Environment & Conservation

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